SHARP

No.	LD −15251B
DATE	Apr. 26 , 2003

TECHNICAL LITERATURE

FOR

TFT - LCD module

MODEL No. LQ197V3DZ41

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DEVELOPMENT ENGINEERING DEPT. Ⅱ
AVC LIQUID CRYSTAL DISPLAY DIVISION
AVC LIQUID CRYSTAL DISPLAY GROUP
SHARP CORPORATION

RECORDS OF REVISION

LQ197V3DZ41

SPEC No.	DATE	REVISED No.	PAGE	SUMMARY	NOTE
LD-15251	Feb. 28. 2003				1st Issue
	Apr. 7. 2003	A	3	Added OS driving condition setting	2nd Issue
			5	Changed Electrical Characteristics	
			7	Changed Timing characteristics	
			9	Changed gray scale condition	
			10	Added Luminance of white (VBRT=5V)	
	Apr. 26. 2003	B	2	Changed tertminal function(39,40pin)	3rd Issue
			3	Changed OS function condition	
			4	Added OS driving ref. circuit	
			5	Added LCD module block diagram	
			12	Changed response time condition	
			16	Changed outline dimension	

1. Application

This technical literature applies to the color 19.7" VGA TFT-LCD module LQ197V3DZ41.

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2. Overview

This module is a color active matrix LCD module incorporating amorphous silicon TFT (Thin Film Transistor). It is composed of a color TFT-LCD panel, driver ICs, control circuit, power supply circuit, inverter circuit and back light system etc. Graphics and texts can be displayed on a 640×RGB×480 dots panel with about 16 million colors by supplying date signal of 24 bit(8 bit x RGB), 4 kind of timing signal, +5V of DC supply voltages and supply voltage for back light.
Also, this module is include the DC/AC inverter to drive the CCFT lamps.

And in order to improve the response time of LCD, this module applies the O/S (over shoot)driving technology for the control circuit. In the O/S driving technology, signals are being applied to the Liquid Crystal according to a pre-fixed process as an image signal of the present frame when a difference is found between image signal of the previous frame and that of the current frame after comparing them.

By using the captioned process, the image signals of this LCD module are being set so that image response can be completed within one frame, as a result, image blur can be improved and clear image performance can be realized.

3. Mechanical Specifications

Parameter	Specifications	Unit
Display size	50 (Diagonal)	cm
	19.7 (Diagonal)	inch
Active area	401.28 (H) x 298.8 (V)	mm
Pixel Format	640 (H) × 480 (V)	pixel
	(1pixel = R + G + B dot)	
Pixel pitch	0.627 (H) × 0.6225 (V)	mm
Pixel configuration	B, G, R vertical stripe	
Display mode	Normally black	
Unit Outline Dimensions *1	462.6(W) ×338.5(H) × 51.6(D)	mm
Mass	(3900)	g
Surface treatment	Anti glare, low reflection coating Hard coating : 2 H Haze : 23 +/- 5%	

(*1)Outline dimensions are shown in Fig.1

4. Input Terminals

4-1. Control circuit driving

CN3 Using connector : 50FLZX-RSM1-A-TB (JST)

Pin No.	Symbol	Function	Remarks
1	GND		
2	CK	Clock signal(sampling each data)	
3	GND		
4	Hsync	Horizontal synchronized signal	【Note 1】
5	Vsync	Vertical synchronized signal	【Note 1】
6	ENAB	Data enable signal(horizontal position)	【Note 2】
7	GND		
8	R0	Red data signal (LSB)	
9	R1	Red data signal	
10	R2	Red data signal	
11	R3	Red data signal	
12	GND		
13	R4	Red data signal	
14	R5	Red data signal	
15	R6	Red data signal	
16	R7	Red data signal (MSB)	
17	GND		
18	G0	Green data signal (LSB)	
19	G1	Green data signal	
20	G2	Green data signal	
21	G3	Green data signal	
22	GND		
23	G4	Green data signal	
24	G5	Green data signal	
25	G6	Green data signal	
26	G7	Green data signal (MSB)	
27	GND		
28	B0	Blue data signal (LSB)	
29	B1	Blue data signal	
30	B2	Blue data signal	
31	B3	Blue data signal	
32	GND		
33	B4	Blue data signal	
34	B5	Blue data signal	
35	B6	Blue data signal	
36	B7	Blue data signal (MSB)	
37	GND		
38	GND		
39	OSTABLE0	Reserved	【Note 4,5】
40	OSTABLE1	Setting terminal (50Hz:High 60Hz:Low)	【Note 4】
41	OSTABLE2	OS Driving Condition 1	【Note 4】
42	OSTABLE3	OS Driving Condition 2	【Note 4】
43	OSTABLE4	OS Driving Condition 3	【Note 4】
44	VDD	+5V Power Supply	
45	VDD	+5V Power Supply	
46	VDD	+5V Power Supply	
47	VDD	+5V Power Supply	
48	L/R	Reverse terminal of Right and Left	【Note 3】
49	U/D	Reverse terminal of Up and Down	【Note 3】
50	GND		

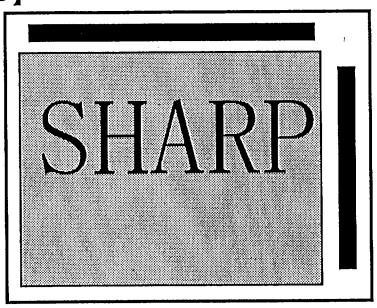
* Shield case contacts GND(Grand) of LCD module.

【Note 1】 The polarity combination of the Hsync.,Vsync.

Hsync	Negative
Vsync	Negative

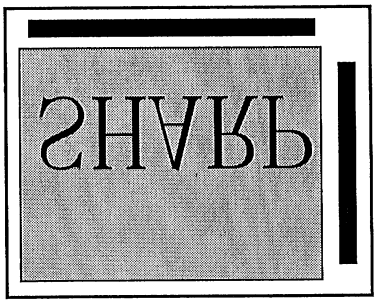
【Note 2】 This module needs ENAB signal. If ENAB signal doesn't input, it is possible not to display normaly.

【Note 3】

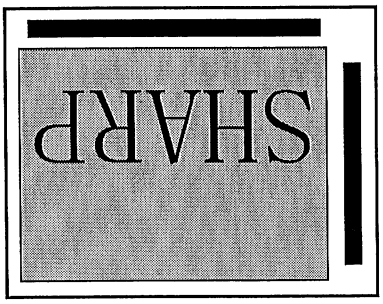


R/L : L
U/D : L

R/L : H
U/D : L



R/L : L
U/D : H



R/L : H
U/D : H

【Note 4】

OS Driving Condition

OS control pin(39-43) should be set like below on actual panel surface temperature

1. Frame frequency 60Hz 0(GND) or1: (3.3V)

Pin No.	Symbol	Panel surface temperature degree C							
		0-5	5-10	10-15	15-20	20-25	25-30	30-35	Over35
43	OSTABLE0	0	1	0	1	0	1	0	1
42	OSTABLE1	0	0	1	1	0	0	1	1
41	OSTABLE2	0	0	0	0	1	1	1	1
40	OSTABLE3	0	0	0	0	0	0	0	0
39	OSTABLE4	0	0	0	0	0	0	0	0

2. Frame frequency 50Hz

Pin no.	Symbol	Panel surface temperature degree C							
		0-5	5-10	10-15	15-20	20-25	25-30	30-35	Over35
43	OSTABLE0	0	1	0	1	0	1	0	1
42	OSTABLE1	0	0	1	1	0	0	1	1
41	OSTABLE2	0	0	0	0	1	1	1	1
40	OSTABLE3	1	1	1	1	1	1	1	1
39	OSTABLE4	0	0	0	0	0	0	0	0

According to the surface temperature of the panel, enter the optimum 3 bit signal into pin No.41,42,43.

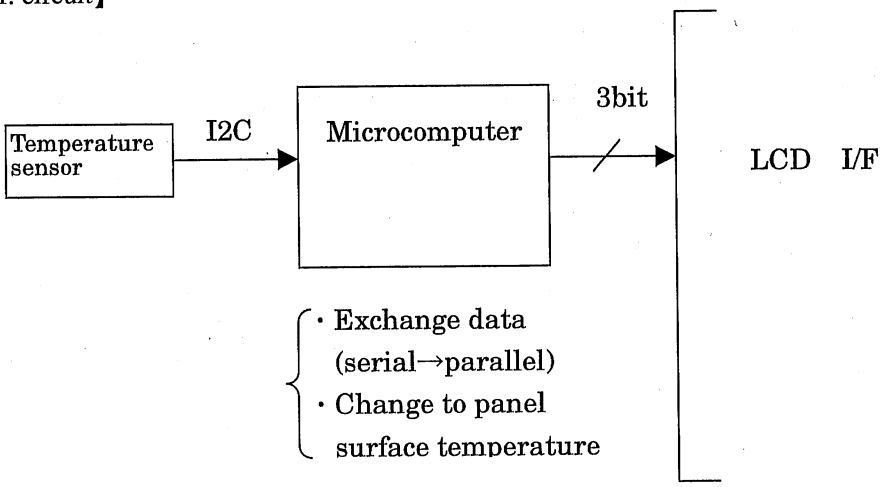
Measuring the correlation between detected temperature by the sensor on PWB in users side and actual surface temperature of panel, convert the temperature detected by the sensor to the surface temperature of panel to enter the 3 bit temperature data.

For overlapping temperatures (such as 5℃,10℃,15℃,20℃,25℃,30℃,35℃) select the optimum parameter, judging from the actual picture image.

【Note 5】

Pin No.39 should be fixed to "Low" level.

【OS Driving ref. circuit】



4-2. Inverter driving for back light

CN1(for inverter control) Using connector : S3B-PH-SM3-TB(JST)

Matching connector : PHR-3(JST)

Pin No.	Symbol	Function	Remark
1	V_{ON}	ON/OFF	【Note 1】
2	V_{BRT}	Brightness Control	【Note 2】
3	GND	GND	

【Note 1】 ON/OFF Function

Input voltage	Function
5V	Inverter: ON
0V	Inverter :OFF

【Note 2】 Brightness control function

Brightness control is available by 0 – 5 V analog input voltage.

Input voltage	Function
5V	Brightness Control (7%) : (Dark)
0V	Brightness Control (100%) : (Bright)

CN2 Suppling for Inverter Power Using connector : S6B-PH-SM3-TB(JST)

Matching connector : PHR-6(JST)

Pin No.	Function
1	12V
2	12V
3	12V
4	GND
5	GND
6	GND

* GND(Ground) of Inverter doesn't contact GND(Ground) of LCD module.

4-3. Back light driving

The back light system is under-lighting type with 10 CCFTs(Cold Cathode Fluorescent Tube).

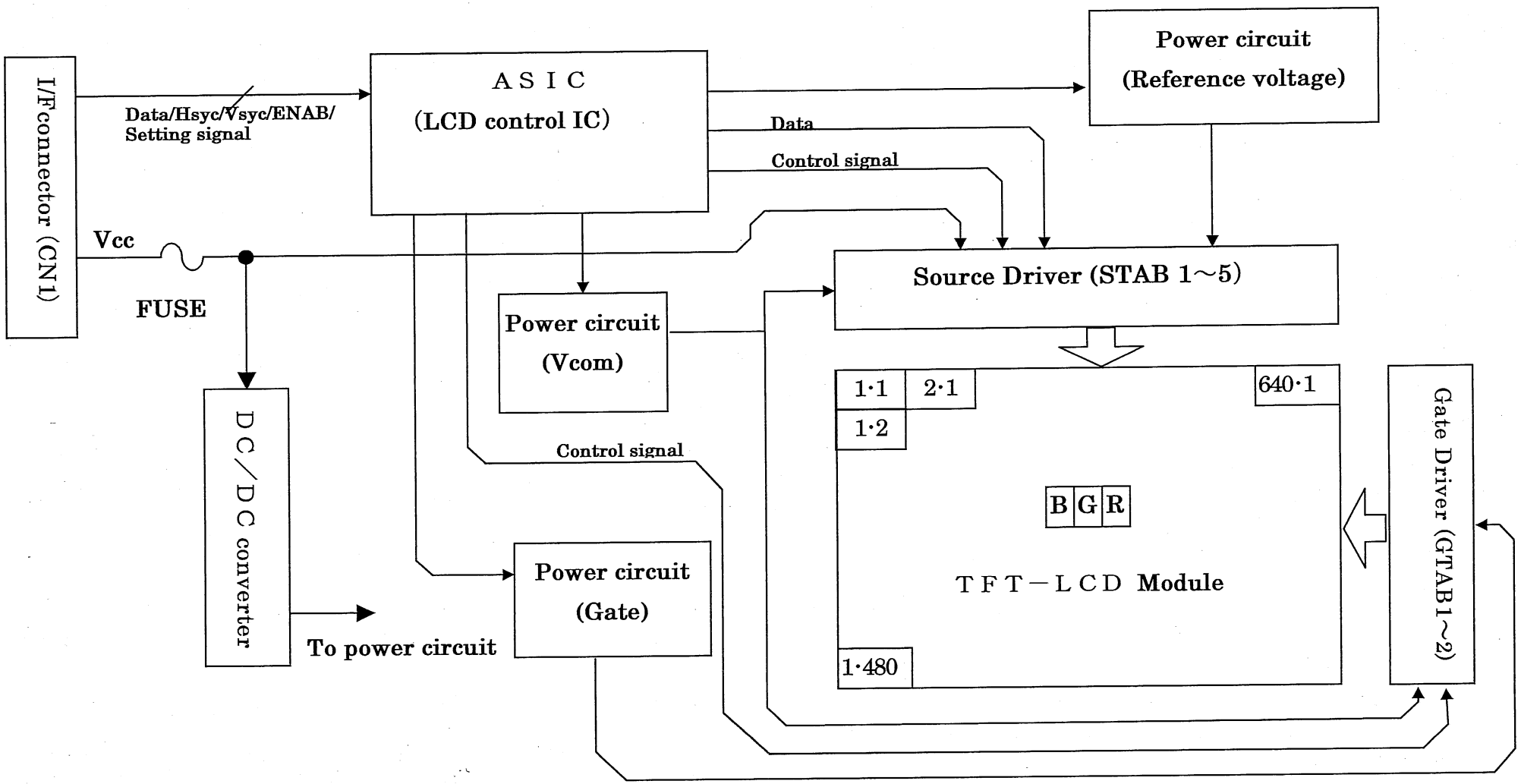
The characteristics of the lamp are shown in the following table. The value mentioned below is at the case of one CCFT.

Item	Symbol	Min.	Typ.	Max.	Unit	Remarks
Life time	T_L	50000	-	-	hour	Note 1

Note 1 : Lamp life time is defined as below in the continuous operation under the condition of Ta=25℃ and V_{BRT}=0V(Brightness Control (100%))

- Brightness becomes 50% of the original value under standard condition.

4-4 ＬＣＤ Module Block Diagram



5. Absolute Maximum Ratings

Parameter	Symbol	Condition	Ratings	Unit	Remark
Input voltage (for Control)	V_I	Ta=25 ℃	-0.3 ~ 3.6	V	Note 1
5V supply voltage (for Control)	Vcc	Ta=25 ℃	0 ~ + 6	V	
Input voltage (for Inverter)	V_{BRT} V_{ON}	Ta=25 ℃	0 ~ + 6	V	
12V supply voltage (for Inverter)	V_{INV}	Ta=25 ℃	0 ~ +14	V	
Storage temperature	Tstg	-	-25 ~ +60	Degree	Note 2
Operation temperature (Ambient)	Topa	-	0 ~ +50	Degree	

Note 1 : CK, R0～R7, G0～G7, B0～B7, Hsync, Vsync, ENAB, R/L, U/D,OSTABLE0～4

Note 2 : Humidity 95%RH Max.(Ta≦40 degree)

Maximum wet-bulb temperature at 39 ℃ or less.(Ta>40℃)

No condensation.

6. Electrical Characteristics

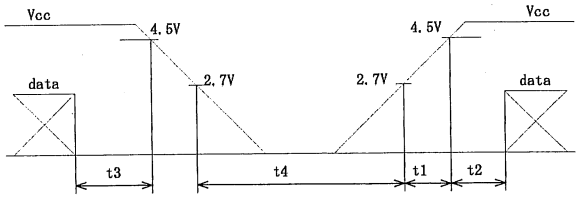
6-1. Control circuit driving

Ta=25 degree

Parameter		Symbol	Min.	Typ.	Max.	Uniit	Remark
+5V supply voltage	Supply voltage	Vcc	+4.5	+5.0	+5.5	V	【Note 1】
	Current dissipation	Icc	-	(490)	(1300)	mA	【Note 2】
Permissive input ripple voltage		V_{RP}	-	-	100	mV_{P-P}	Vcc=+5.0V
Input Low voltage		V_{IL}	-	-	1.0	V	【Note 3】
Input High voltage		V_{IH}	2.3	—	3.6	V	
Input leak current (Low)		I_{OL1}	-	-	1.0	μA	V_I=0V 【Note 3】
Input leak current (High)		I_{OH1}	-	-	1.0	μA	V_I =Vcc 【Note 3】

【Note 1】

1) Input voltage sequences



0 < t1 ≦ 10ms, 0 < t2 ≦ 10ms

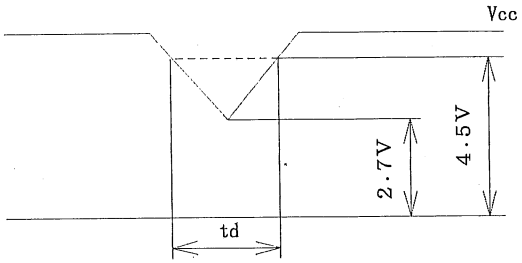
0 < t3 ≦ 1s, t4 ≧ 1s

2) Dip conditions for supply voltage

a) 2.7V ≦ Vcc < 4.5V

td ≦ 10ms

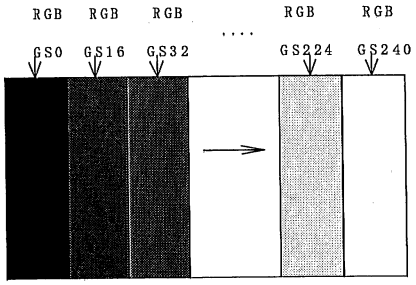
b) Vcc < 2.7V



Condition of Dip conditions for supply voltage

Is based on input voltage sequence.

【Note 2】Typical current situation : 16 gray-bar pattern(Vcc=+5.0V)
The explanation of RGB gray scale see section 16.



【Note 3】CK,R0～R7,G0～G7,B0～B7,Hsync,Vsync,
ENAB,R/L, U/D,OSTABLE0～4

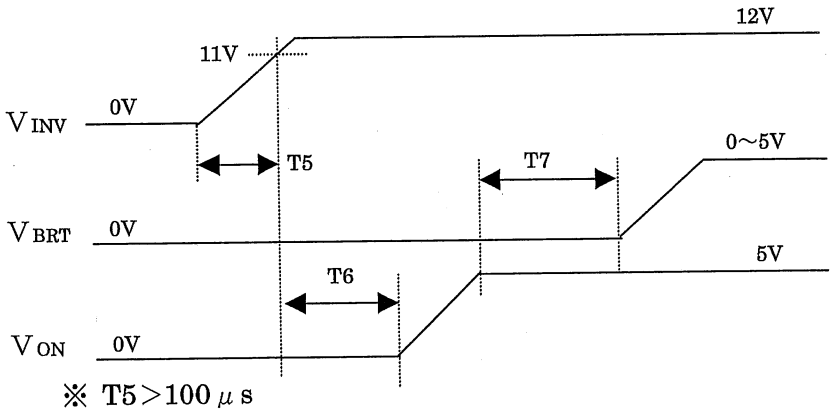
6-2. Inver driving for back light

The back light system is under-lighting type with 10 CCFTs (Cold Cathode Fluorescent Tube)

Ta=25℃

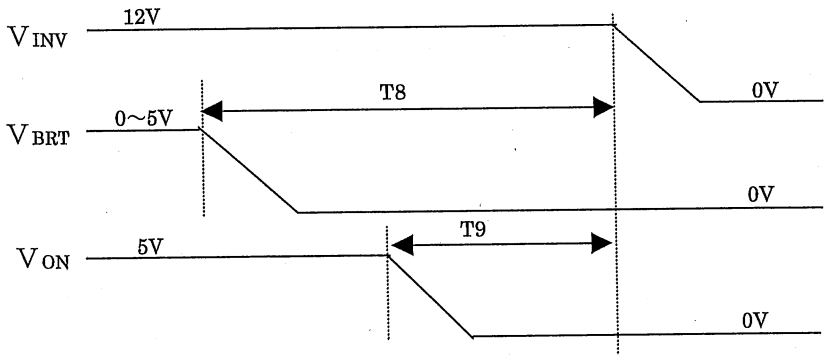
Parameter		Symbol	Min.	Typ.	Max.	Unit	Remark
+12V	Current dissipation	I_{INV}	—	(3.4)	(4.1)	A	V_{BRT}=0V
	Supply voltage	V_{INV}	11	12	13	V	【Note 1】
Permissive input ripple voltage		V_{RP}	-	-	200	mV_{P-P}	Vinv=+12V
Input voltage (Low)		V_{ONL}	0	-	0.5	V	【Note 1,2】
Input voltage (High)		V_{ONH}	3.0	-	5.0	V	impedance =24.7k Ω
Brightness control voltage (100%)		V_{BRT}	0	-	0.3	V	【Note 1,3,4】
Brightness control voltage		V_{BRT}	0.7	-	5.0	V	impedance =20.6k Ω

【Note 1】1)Vinv-turn-on condition



※ T5＞100 μs
※ T6＞1ms
※ T7＞1ms

2） Vinv-turn-off condition



※ T8＞1ms
※ T9＞1ms

【Note 2】 V_{BRT}, V_{ON}

【Note 3】 V_{ON}

【Note 4】Refrain from using the device under the condition of $V_{BRT} = 0.5 \pm 0.2V$ because of the possibility of flicker on display. In case of $V_{BRT} > 5.0V$, the protective circuit may stop driving the inverter.

7. Timing characteristics of input signals

Timing diagrams of input signal rare shown in Fig.2

7-1. Timing characteristics

Parameter		Symbol	Min.	Typ.	Max.	Unit	Remark
Clock	Frequency	1/Tc	-	25.2	TBD	MHz	
	High time	Tch	5	-	-	ns	
	Low time	Tc1	10	-	-	ns	
Data	Set up time	Tds	5	-	-	ns	
	Hold time	Tdh	10	-	-	ns	
Horizontal synchronized signal	Cycle	TH	30.00	31.78	-	μs	
			798	800	802	Clock	
	Pulse width	THp	2	96	200	Clock	
Vertical synchronized signal	Cycle	TV	515	525	560	Line	
	Pulse width	TVp	2	-	34	Line	
Horizontal display area		THd	640	640	640	Clock	
Vertical display area		TVd	480	480	480	Line	
Hsync-Clock phase difference		THc	10	—	Tc-10	ns	
Hsync-Vsync phase difference		TVh	0	—	TH-THp	Clock	

Note) In case of lower frequency , the deterioration of display quality , flicker etc, may be occurred.
In case of turn-off , turn-off may be after input signal for "black".

7-2. Horizontal display position

The horizontal display position is determined by the rising edge of ENAB signal .

Parameter		Symbol	Min.	Typ.	Max.	Unit	Remark
Enable signal	Set up time	Tes	5	-	Tc-10	ns	
	Puls width	Tep	TBD	640	TH-140	Clock	
Hsync-Enable signal phase difference		The	902-TH	104	906-TH	Clock	

Note) This module must input ENAB signal. Input-timing is defined below.(Fig.2)

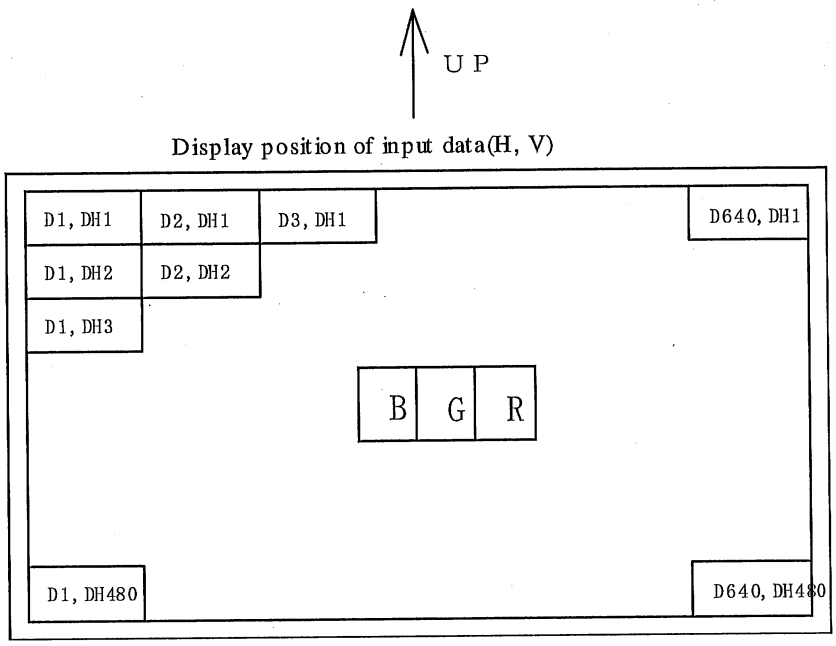
7-3. Vertical display position

The verticta display position is determined by the falling edge of Vsync signal .

Parameter	Symbol	Min.	Typ.	Max.	Unit	Remark
Vertical data start position	TVs	34	34	34	Line	

Note) ENAB signal has no relation to the vertical display position

7-3. Input data signal and display position on the screen



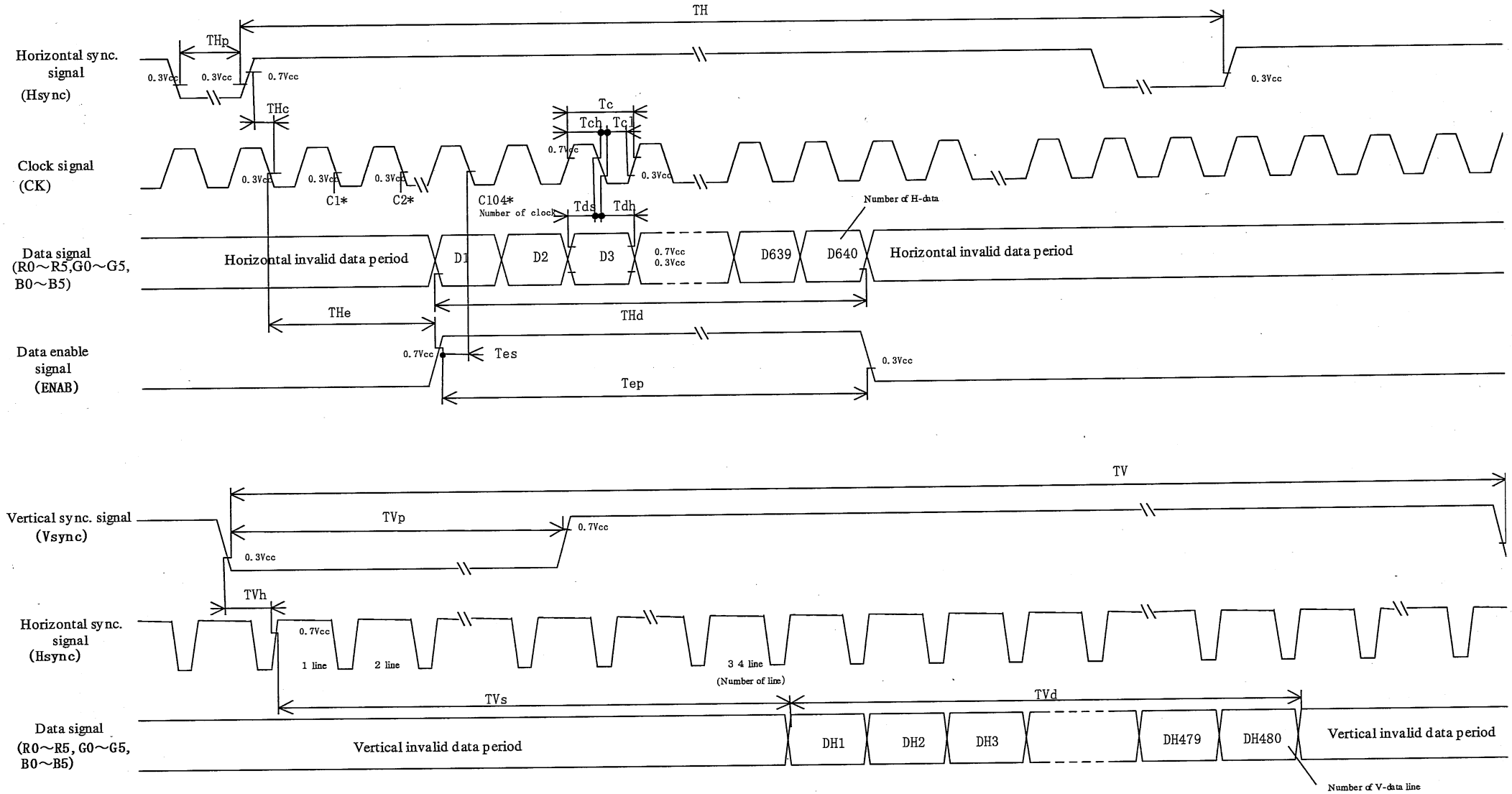


Fig.2 Input signal waveforms

8. Input Signal, Basic Display Colors and Gray Scale of Each Color

	Color & Gray scale	Gray Scale	R0	R1	R2	R3	R4	R5	R6	R7	G0	G1	G2	G3	G4	G5	G6	G7	B0	B1	B2	B3	B4	B5	B6	B7
Basic Color	Black	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Blue	–	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	X	X	1	1	1	1	1	1
	Green	–	0	0	0	0	0	0	0	0	X	X	1	1	1	1	1	1	0	0	0	0	0	0	0	0
	Cyan	–	0	0	0	0	0	0	0	0	X	X	1	1	1	1	1	1	X	X	1	1	1	1	1	1
	Red	–	X	X	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Magent	–	X	X	1	1	1	1	1	1	0	0	0	0	0	0	0	0	X	X	1	1	1	1	1	1
	Yellow	–	X	X	1	1	1	1	1	1	X	X	1	1	1	1	1	1	0	0	0	0	0	0	0	0
	White	–	X	X	1	1	1	1	1	1	X	X	1	1	1	1	1	1	X	X	1	1	1	1	1	1
Gray Scale of Red	Black	GS0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	⇧	GS1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Darker	GS2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	⇧	↓					↓								↓								↓			
	⇩	↓					↓								↓								↓			
	Brighte	GS250	0	1	0	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	⇩	GS251	1	1	0	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Red	GS252	X	X	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Gray Scale of Green	Black	GS0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	⇧	GS1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Darker	GS2	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	⇧	↓					↓								↓								↓			
	⇩	↓					↓								↓								↓			
	Brighte	GS250	0	0	0	0	0	0	0	0	0	1	0	1	1	1	1	1	0	0	0	0	0	0	0	0
	⇩	GS251	0	0	0	0	0	0	0	0	1	1	0	1	1	1	1	1	0	0	0	0	0	0	0	0
	Green	GS252	0	0	0	0	0	0	0	0	X	X	1	1	1	1	1	1	0	0	0	0	0	0	0	0
Gray Scale of Blue	Black	GS0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	⇧	GS1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
	Darker	GS2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
	⇧	↓					↓								↓								↓			
	⇩	↓					↓								↓								↓			
	Brighte	GS250	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	1	1	1
	⇩	GS251	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1	1	1	1	1
	Blue	GS252	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	X	X	1	1	1	1	1	1

0 :Low level voltage, 1 :High level voltage,

Each basic color can be displayed in 253 gray scales from 8 bit data signals. According to the combination of total 24 bit data signals, the 16-million-color display can be achieved on the screen.

9. Optical characteristics

Ta=25 degree, Vcc=+5V , Vinv=+12V

Parameter		Symbol	Condition	Min.	Typ.	Max.	Unit	Remark
Viewing angle range	Horizontal	θ 21, θ 22	CR≧10	80	85	-	Deg.	【Note1,4】 VBRT=0V
	Vertical	θ 11 θ 12		80	85	-	Deg.	
Contrast ratio		CRn	Best Viewing Angle	TBD	(600)	-		【Note2,4】 VBRT=0V
Response time		τ r τ d	θ =0 deg.	-	(15)	TBD	ms	【Note3,4】 VBRT=0V
Chromaticity of white		X		0.283	0.308	0.333	-	【Note 4】 VBRT=5V
		Y		0.281	0.306	0.331	-	
Luminance of white		Y_{L1}		TBD	(500)	-	cd/m^2	【Note 4】 VBRT=0V
		Y_{L1}		-	30	-	cd/m^2	【Note 4】 VBRT=5V
Luminance uniformity		δ w			-	1.25		【Note 5】 VBRT=0V

*The measurement shall be executed 30 minutes after lighting at rating.

The optical characteristics shall be measured in a dark room or equivalent state with the method shown in Fig.3 below.

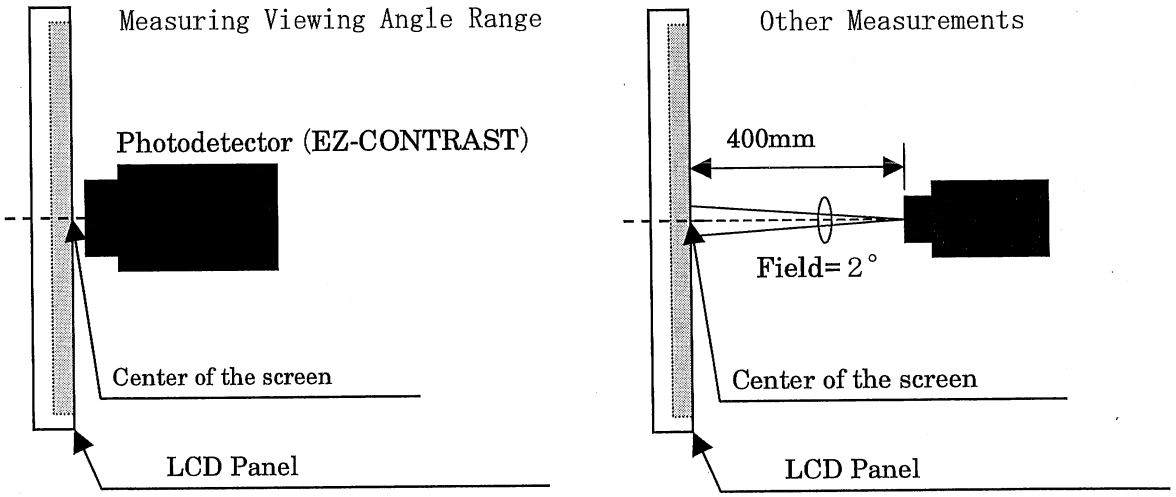
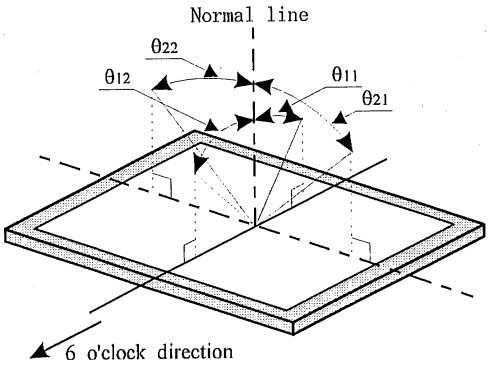


Fig. 3 Optical characteristics measurement method

【Note 1】Definitions of viewing angle range :



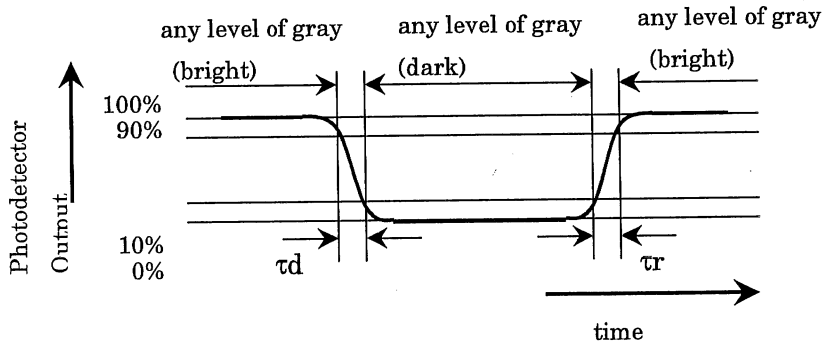
【Note 2】Definition of contrast ratio :

The contrast ratio is defined as the following.

$$\text{Contrast Ratio (CR)} = \frac{\text{Luminace(brightness) with all pixels white}}{\text{Luminace(brightness) with all pixels black}}$$

【Note 3】Definition of response time with O/S driving

The response time is defined as the following figure and shall be measured by switching the input signal for "any level of gray (bright)" and "any level of gray (dark)".

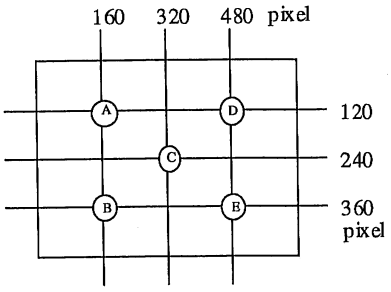


【Note 4】This shall be measured at center of the screen.

【Note 5】Definition of white uniformity ;

White uniformity is defined as the following with five measurements.(A～E)

$$\delta w = \frac{\text{maximum Luminance of five points(brightness)}}{\text{minimum Luminace of five points(brightness)}}$$



10. Display Quantity

The display quality of the color TFT-LCD module shall be incompliance with the incoming inspection Standard.

11. Handling Precautions of the module

a) Be sure to turn off the power supply when inserting of disconnecting the cable.

b) Brightness control voltage is switched for "ON" and "OFF", as shown in Fig.4. Voltage difference generated by this switching, ΔV_{INV}, may affect a sound output, etc. when the power supply is shared between the inverter and its surrounding circuit. So, separate the power supply of the inverter circuit with the one of its surrounding circuit.

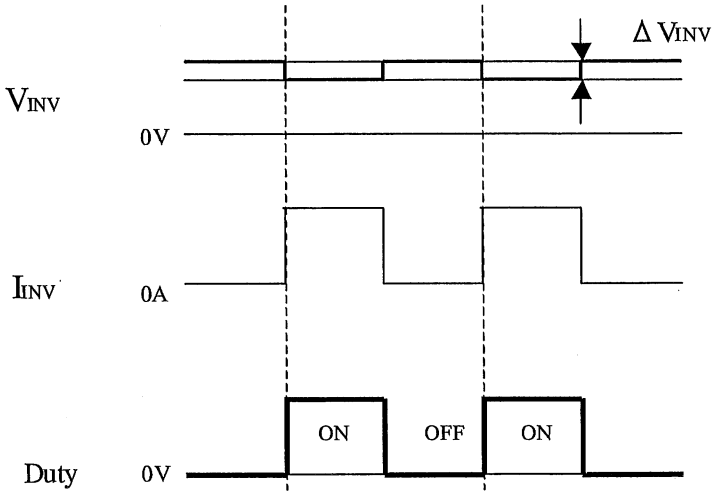


Fig.4 Brightness control voltage.

c) Be sure to design the cabinet so that the module can be installed without any extra stress such as warp or twist.

d) Since the front polarizer is easily damaged, pay attention not to scratch it.

e) Since long contact with water may cause discoloration or spots, wipe off water drop immediately.

f) When the panel surface is soiled, wipe it with absorbent cotton or other soft cloth.

g) Since the panel is made of glass, it may break or crack if dropped or bumped on hard surface. Handle with care.

h) Since CMOS LSI is used in this module, take care of static electricity and take the human earth into consideration when handling.

i) The module has some printed circuit boards (PCBs) on the back side, take care to keep them form any stress or pressure when handling or installing the module; otherwise some of electronic parts on the PCBs may be damaged.

j) Observe all other precautionary requirements in handling components.

k) When some pressure is added onto the module from rear side constantly, it causes display non-uniformity issue, functional defect, etc. So, please avoid such design.

l) When giving a touch to the panel at power supply, it may cause some kinds of degradation. In that case, once turn off the power supply, and turn on after several seconds again, and that is disappear.

m) When handling LCD modules and assembling them into cabinets, please be noted that long-term storage in the environment of oxidization or deoxidization gas and the use of such materials as reagent, solvent, adhesive, resin, etc. which generate these gasses, may cause corrosion and discoloration of the LCD modules.

n) Since inverter board's GND is not connected to the frame of the LCD module, please connect it with the customer's GND of inverter power supply.

12. Packing form

a) Piling number of cartons: 4 (maximum)
b) Packing quantity in one carton : 2
c) Carton size : 393mm(W)×293mm(H)×515mm(D)
d) Total mass of one carton filled with full modules : (9.4Kg)

13. Reliability test items

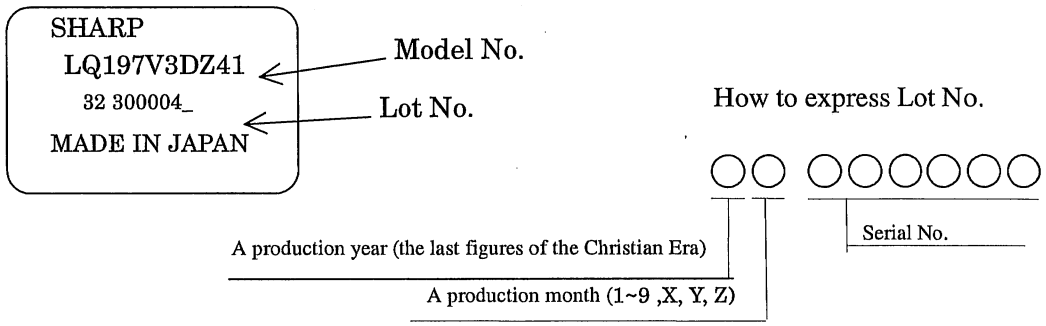
No.	Test item	Conditions
1	High temperature storage test	Ta= 60℃ 240h
2	Low temperature storage test	Ta= - 25℃ 240h
3	High temperature and high humidity operation test	Ta= 40℃ ; 95%RH 240h (No condensation)
4	High temperature operation test	Ta= 50℃ 240h
5	Low temperature operation test	Ta= 0℃ 240h
6	Vibration test (non-operation)	Frequency : 10 ~ 57Hz/Vibration width(one side) : 0.075mm : 58 ~ 500Hz/Gravity : 9.8m/s2 Sweep time: 11 minutes Test period : 3 hours(1h for each direction of X, Y, Z)
7	Shock test (non-operation)	Max. gravity : 490m/s2 Pulse width : 11ms, sine wave Direction : +/-X, +/-Y, +/-Z, once for each direction.

【Result evaluation criteria】

Under the display quality test conditions with normal operation state, these shall be no change which may affect practical display function.

14. Others

1) Lot No. Label;



2) Adjusting volume have been set optimally before shipment, so do not change any adjusted value. If adjusted value is changed, the specification may not be satisfied.
3) Disassembling the module can cause permanent damage and should be strictly avoided.
4) Please be careful since image retention may occur when a fixed pattern is displayed for a long time.
5) When any question or issue occurs, it shall be solved by mutual discussion.

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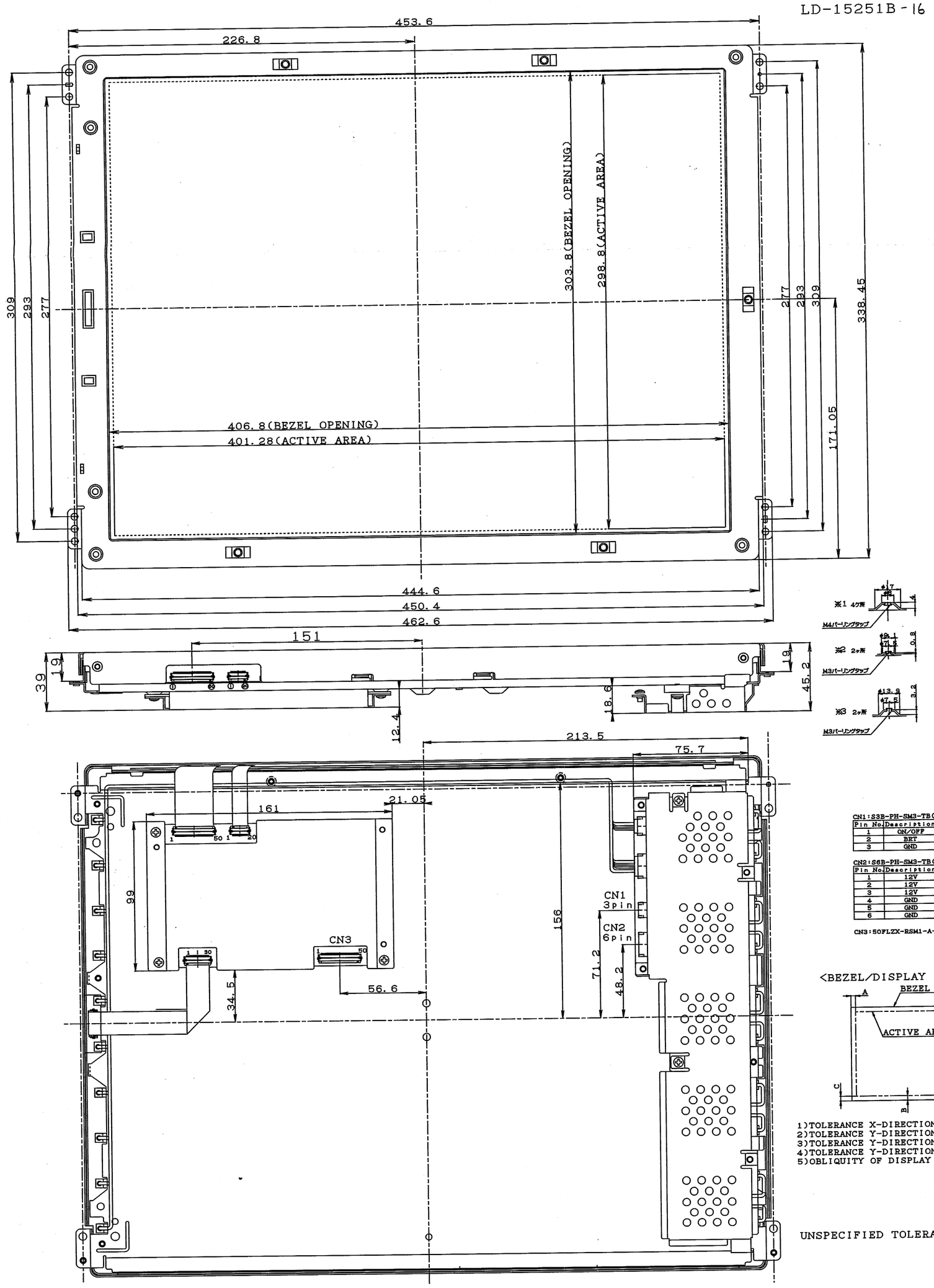

CN1:S3B-PH-SM3-TB(JST)

Pin No.	Description
1	ON/OFF
2	BRT
3	GND

CN2:S6B-PH-SM3-TB(JST)

Pin No.	Description
1	12V
2	12V
3	12V
4	GND
5	GND
6	GND

CN3:50FLZX-RSM1-A-TB(JST)

<BEZEL/DISPLAY POSITION>

1)TOLERANCE X-DIRECTION A:2.5±0.8
2)TOLERANCE Y-DIRECTION B:2.5±0.8
3)TOLERANCE Y-DIRECTION C:2.76±0.8
4)TOLERANCE Y-DIRECTION D:2.76±0.8
5)OBLIQUITY OF DISPLAY AREA |C-D|<0.8

UNSPECIFIED TOLERANCE TO BE ±0.6

FIG. 1 OUTLINE DIMENSIONS (LQ197V3DZ41)